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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,600	01/16/2001	Shlomo Berliner	052625-5003	9435

9629 7590 02/06/2004
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EXAMINER

D AGOSTA, STEPHEN M

ART UNIT	PAPER NUMBER
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2683

12

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/759,600

Applicant(s)

BERLINER ET AL.

Examiner

Stephen M. D'Agosta

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1,2,3,4. 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-28 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Yokev et al. US 5,596,330 and further in view of Cease et al. US 3,681,695 (hereafter Yokev and Cease).

As per **claims 1, 14, 25-28 and 30** Yokev teaches a wireless transmission system (figure 1) comprising:

A first wireless device including:

- first receiver that receives at least one forward path RF signal
- first transmitter for transmitting plurality of reverse path RF signals having different carrier frequencies, wherein reverse path RF signals are phase coherent with the at least one forward path RF signal (abstract teaches TOA system with two simultaneous signals having different carrier frequencies – since Yokev does not elaborate on phase coherence, the examiner interprets the system as being operable on signals that are OR are not phase coherent).

A second wireless device including:

- a second transmitter that transmits the at least one forward path RF signal received by first receiver of first wireless device (figure 1 shows transmitters and receivers, ie. base stations and wireless users)
- second receiver that receives reverse path RF signals (see figure 1 again)

- a detector that generates phase comparison data based on at least the received reverse path RF signal (abstract teaches "a phase difference is observed between the two carriers at a distance" which is interpreted as a detecting device)

-controller/processor that generates transmission path data using the detected phase data and the carrier frequencies and identifies from the transmission path data time delay information for the RF signals traveling in a direct path between the first/second wireless devices (abstract teaches TOA technique and figure 9, #801 is processor).

But is silent on detecting/using amplitude data.

Cease teaches a system that uses both phase and amplitude detectors for multipath compensation (title, abstract and figure 1, #36 and #48). Since Cease teaches using both, one skilled in the art would modify Yokey to use both as well.

With further regard to claims 25, 26 and 30, Yokey teaches the use and control of a synthesizer (figure 10, see middle of the page – two Double Loop Synthesizers shown, both are controlled by MicroController 68HC05B6). The MicroController will contain a computer readable storage medium containing instructions that controls the device/system as well.

With further regard to claim 28, Yokey teaches the use of IFT and FFT techniques (C4, L48-59 and C10, L36-48)

It would have been obvious to one skilled in the art at the time of the invention to modify Yokey, such that amplitude can be detected, to provide multiple means in which to measure a signal and determine distance (ie. phase, amplitude, frequency, etc.).

As per **claim 2**, Yokey teaches claim 1 wherein the first device includes a first synthesizer that generates a plurality of reverse path signals from the forward signals, each being phase coherent with the forward path RF signal (figure 10, see middle of page, two Double Loop Synthesizers shown).

As per **claims 3 and 15**, Yokey teaches claim 1/14 and a phase detector that generates phase data (abstract teaches determining a phase difference) **but is silent on** quadrature amplitude determining.

Cease teaches a system that uses both phase and amplitude detectors for multipath compensation (title, abstract and figure 1, #36 and #48). If Yokey's system utilized QAM (as is well known), one skilled in the art would then use a QAM phase/amplitude detector.

It would have been obvious to one skilled in the art at the time of the invention to modify Yokey, such that quadrature amplitude can be measured, to provide means for using the system in a QAM environment.

As per **claims 4-5, 20-21**, Yokey teaches claim 1/14 wherein the at least on forward path and reverse paths are full/half duplex transmissions (remote mobile units can transmit and receive data from base stations, C4, L2-15).

As per **claims 6 and 16**, Yokey teaches claim 1/14 wherein the forward path signal comprises a plurality of forward path RF signals comprising different carriers modulated with a modulation signal, the different carrier frequencies having approximately the same multipath transmission characteristics between the first and second wireless devices (abstract teaches simultaneously transmitting two radio frequency carriers having different carrier frequencies such that a phase difference can be observed, which reads on the claim).

As per **claim 7**, Yokey teaches claim 6 wherein the first wireless device further comprises a demodulator for detecting the modulation signal in said plurality of forward path signals and a synthesizer for generating said plurality of reverse path signals from the modulation signal (figures 9 and 10 show the transmitter and receiver which includes a demodulator. Figure 10 also shows two synthesizers).

As per **claims 8-9**, Yokev teaches claim 1 wherein the at least one forward path signal comprises a carrier signal OR a modulated signal (Yokev teaches the transmission of two RF signals using different carriers. The examiner interprets this as reading on the claim since one signal can be only a carrier signal).

As per **claims 10-11, 17, 19**, Yokev teaches claim 9/1/16/14 wherein the second device comprises a synthesizer for generating a plurality of third RF signals that are phase coherent with the modulation signal, wherein the detector includes a phase comparator for phase comparing the plurality of third RF signals and the plurality of reverse path RF signals.

Since Yokev teaches transmitting two signals, the examiner interprets the transmission of three as adding to the accuracy of the system (albeit making it more costly and complex). Hence one skilled in the art would provide for using a plurality of third RF signals. Yokev teaches observing and determining differences in phase (see abstract).

As per **claims 7, 22**, Yokev teaches claim 1/14 wherein Yokev teaches the use of IFT and FFT techniques (C4, L48-59 and C10, L36-48).

As per **claims 13, 23**, Yokev teaches claim 12/22 wherein the controller further uses a peak search to identify time delay information (C18, L16-20).

As per **claim 18**, Yokev teaches claim 17 wherein at least one forward path is frequency hopping spread spectrum (abstract teaches frequency hopped spread spectrum).

As per **claim 24**, Yokev teaches claim 22 wherein the processor determines the distance between the two wireless devices (abstract teaches locating the one wireless device whose coordinates can then be used to determine its distance to ANY other object whose location is also known).

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Claims 1-28 and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Yokey/Cease and further in view of Hane US 4,804,961 (hereafter Hane).

As per **claim 29**, Yokey teaches claim 28 **but is silent on** wherein generating amplitude/phase data comprises generating local RF signals using the forward path signal and comparing the phase of the local RF signal and the received RF signal.

Hane teaches comparison of transmitted (forward or reverse) and received (reverse or forward) signals which are used to determine distance between objects (abstract and figure 1).

It would have been obvious to one skilled in the art at the time of the invention to modify Yokey, such that one compares the phase of the local RF signal and the received RF signal, to provide means for comparing the transmitted signal with one that is received back from the receiver for measurement purposes.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1. Kupfer US 4,315,260 teaches measuring distance between two objects.
2. Bevan et al. US 6,489,923 teaches position location.
3. Parl et al. US 5,883,598 teaches position location system and method.
4. Parl et al. US 6,259,404 teaches position location system/method.
5. Smith US 6,556,942 teaches short range Spread Spectrum radiolocation.
6. Schuchman et al. US 6,148,195 teaches position determination.
7. Heldwein US 4,229,737 teaches ranging system
8. De Champlain et al. US 6,437,740 teaches wireless tracking system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7493 for regular communications and 703-746-7493 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist on 703-306-0377.



WILLIAM TROST
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